

Speech by Alexander Graham Bell, 1913

1913 Alexander Graham Bell's Contributions to Knowledge. AVIATION. 13.

Address of Dr. Alexander Graham Bell in presenting the Langley Medal to Mr. Gustave Eiffel and to Mr. Glenn Curtis. Recorded in Smithsonian Publication, 2233, for 1913. Copy of publication bound in "Volume 8, Aviation."

File Creation 13 Mr. Chairman, Your Excellency and Ladies & Gentlemen, We are met together on the anniversary of a historical day event .

On the sixth of May 1896 a steam engine provided with wings made a successful flight in the air over the Potomac River at Quantico, Va., about sixty miles from Washington, D.C.

There was no man in the machine, and yet it pursued its way steadily through the air, continually rising until its power gave out, when it descended when its propeller stopped and it descended so gently to the water that it was immediately ready for another flight.

The second flight was equally successful, and though the total distance was not great, barely exceeding one half mile it succeeded in demonstrating to the world the practicability of mechanical flight by machines heavier than the air and driven by their own motive power.

The production of this machine was really the culminating point of the researches of the late Secretary of The Smithsonian Institution, Dr. Samuel Pierpont Langley, The and the Smithsonian Institution very properly celebrates the sixth of May as "Langley Day"

For many years before 1896 Professor Langley, being assured in his own mind of the practicability of mechanical flight had devoted himself to scientific experiments with aeroplanes , that is, with flat surfaces or planed 2 driven edgeways through the air, at

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varying angles of incidence to the horizon. a p4 In his usage the word aeroplanes , while applicable to the wings of a flying machine, was not applicable to the machine s itself. The machine as a whole he called an aerodrome , from the Greek word aerodromos , “traversing the air”. In the terminology employed by him aerodromics is the art of traversing the air — the art of aerial locomotion; and an aerodrome was a machine for traversing the air.

Great confusion has resulted from the use of these words in a different sense by the aviators of France

Some confusion has arisen in the present use of these terms and this is really due to the success of the French to the influence of the French who introduced the word aeroplane as derived from the Greek aeroplanos , “wandering in air”, and it applied it to mean a heavier-than-air flying machine itself, and while the French are to be congratulated?? upon it is unfortunate that this word has come to be used in a dual sense, i.e. flat wings and flying machines of a flat surface driven through the air, and of a flying machine, quite irrespective of the? character of the wing surfaces employed on the machine . In Langley's sense, aeroplanes had gone entirely out of use, as curved surfaces are now employed.

Again the French intorduced the word aerodrome after the analogy of “hippodrome”, and applied it first to the building or shed, in which flying machines were housed, as inappropriate a term as if we were to call a stable a 3 “hippodrome”. as if we were to apply the term hippodrome to a stable where horses were housed.

Within the last two or three years the term has been applied to a field for practising aviation above which aviation is practised. While this application is less objectionable is practised. While this application is less objectionable than the former, it is still inappropriate, because the word is derived from aerodromos , = traversing the air, and it is therefore stretching its meaning to apply it to a field. Of course, it is inevitable in the introduction of a new art that there should be some confusion in the use of the first terms,

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employed and the great success of the French in aviation has led to the introduction of the technical terms employed by them into other countries.

In spite of the death of Langley the words aeroplane and aerodrome are still used to a certain extent in Langley's sense in America, in Canada and in Great Britain, and a new word "Drome" has appeared — a contraction of aerodrome the contracted form of aerodrome employed both as a noun and a verb. For example the newspapers of the country in reporting the remarkable flight of Paulhan at Los Angeles, California, almost universally spoke of him as "droming over the country", and in a recent article in "The Youth's Companion" (see BB Recorder Vol 3, pp446–447, extract from Youth's Companion)

NOTE for Great Britain, see article by Prof. G.H.Bryan F.R.S. "Nature" Vol 83 p. 10

It will thus be seen that the words aeroplane and aerodrome, though much less used than during Langley's life are by no means extinct in Langley's sense than during his life, are by no means extinct, and time alone can tell and there are many who, like myself, believe Langley's terms are more appropriate and more in accordance with their etymology than those that have recently more recently appeared

a The knowledge that a scientific so eminent a man of the eminence attained by Langley , and as the Secretary of The Smithsonian Institution, believed in the possibility of mechanical flight and was carrying on scientific experiments to attain that end, proved a great stimulus and encouragement to many less eminent men who were working along the same lines under the discouragement and ridicule from the incredulous world It was as much as a man's reputation was worth to be known to be investigating this subject & The subj had not been consider seriously since the days of D. & his flying w/c and when his machine actually flew on the sixth of May 1896 it acted as a still greater stimulus to the world convinced the thoughtful that mechanical flight was after all a practicable thing. Perhaps I may be excused for a few saying a few words concerning this remarkable

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flight of May six, 1896 As I was the only witness of this remarkable flight outside of the workmen employed I may perhaps be pardoned for saying a few words about it. Prof Langley had met with so many failures that, though hopeful, he was somewhat doubtful of the result, and he invited me to witness the experiment, on the that I was as the only man he knew that whom he could bear to be a witness of a failure 5 I found a houseboat containing all his apparatus anchored in a little bay the little Bay of Quantico and on the roof his apparatus machine was arrnged ready to be shot off by a huge catapult. I had a boy row me out on the ?? bay where I thought I could get a good snap shot of the machine when it leaped into the air, while Professor Langley, too nervous to be close to the scene of operations retreated to the shore, and I saw him standing lonely on the end of a little pier with the wooded shore behind him. Then the whirr of the propellers was heard and the catapult was released causing the machine to shoot out into the air almost horizontally. It was a huge model, thirteen feet from tip to tip, of the wings and sixteen feet from head to tail, the whole propelled by a wonderfully light steam engine of Prof Langley's own design driving two propellers, one on either side of the middle of the w/c dragonfly . Then came the critical moment Would it fall into the water? Would it strike against the trees on the that surrounded the bay? Or would it a ? cend and clear them? The queries were soon answered. For the huge bird-like machine gracefully soared from twenty to thirty feet above the tops of the trees, turning slightly as it rose, and made a beautiful flight of over half-a-mile, when the steam was exhausted the propeller s stopped and it began to come down. The descent was as fascinating as the ascent, and it glided gracefully to the surface of the water without any other injury than a wetting. It was picked up and found to be quite practically uninjured except for a wetting. The experiment was then repeated with even greater success than before . and the workmen employed cheered the lonely Professor hailed the success of the experiment with loud cheers, in which I joined.

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The prophecy received its fulfilment but not until the beginning of the twentieth century. In August 1903 Professor Langley produced his man-carrying aerodrome

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In 1898 the Board of Ordnance & Fortification after carefully studying the flights of 1896 appropriated \$ 50,000 00 to enable Langley to experiment with a full sized aerodrome carrying a man. This was not completed until 1903 and on August 8 of that ? year a quarter sized model of it propelled by a gasoline engine made a beautiful public flight On September 7, 1903, the full sized aerodrome, carrying Mr. F. W. Manley, as aviator, was tried on the Potomac, but when the catapult was released the aerodrome sped along the track on the top of the house-boat attaining sufficient headway for normal flight; but at the end of the rails it was jerked violently down at the front, and plunged headlong into the river. It was subsequently discovered that the guy post that strengthened the front pair of wings had caught in the launching ways, and bent so much that those wings lost all support. A second launching was attempted on the Potomac River near Washington, on December 8 1903. This time the rear guy post was injured, crippling the rear wings, so that the aerodrome pitched up in front and plunged over backwards into the water, fortunately the aviator, Mr. Manley, received no injury in either case. It will thus be seen that Langley's aerodrome was never successfully launched, so that it had no opportunity of showing what it could do in the air. The defect lay in the launching mechanism employed and not in the machine & itself, which is recognised by all experts as a perfectly good flying machine, excellently constructed and made long before the appearance of other machines.

Langley's efforts at aviation were received with public ridicule, and he found it impossible to obtain the necessary funds to try the experiment again

Professor Langley was of a very sensitive nature and the public ridicule with which his efforts were received had a good deal to do with the illness which caused his death Ver Not long after the accident he received a paralytic stroke, and after partially recovering from this, another stroke ended his life. in 1906.

While on his death bed he received the following resolution, passed by the newly organized Aero Club of America, dated January 20 1906,

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(Zahm page 244)

It is gratifying to know that he knew before he died that his efforts were appreciated by those most competent to judge.

The second and last trial of Langley's aerodrome occurred December 8, 1903, and on December 17 of that same year, the Wright Brothers made their first flight in their gliding machine provided with a 16HP engine and two screw propellers. Little or nothing was known of this flight by the general public. The Wright brothers removed their machine to Dayton, Ohio. During 1904, and 1905 numerous flights were made in Dayton Ohio, culminating in a flight of eleven 9 miles on September 26, 1905. These were all in secret, After this, field practice with them ceased for more than two years to enable them to preserve the secrecy which they had hitherto maintained.

A few statements concerning their success leaked out into the public press, but were generally received with incredulity and unbelief.

A competent scientific investigator was sent from France to Dayton, Ohio to investigate the truth of rumours that had appeared in the newspapers of success that had found their way into the Press. He was unable to obtain any definite information concerning the trials that ?? had been made., but by interviewing the neighboring farmers he was able to satisfy himself that flights had actually been made, and so reported to his principals in France, and it was from France that America received the first authentic news that the Wright Brothers had actually flown.

Then M. Archdeacon stirred up the patriotic spirit of the French, not to be beaten by America, and offered his prize for the first and in 1903 founded a prize of Fr3000 to be awarded to the first person who should sail or fly twenty-five metres, under certain conditions.

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The whole art of aerial locomotion originated in France. In 1783, the Montgolfiers produced the balloon their hot-air balloon, and in the same year M. Charles and the Brothers Roberts gave us the hydrogen balloon. After the lapse of 100 years, Nadar issued his celebrated manifesto in which he advocated the heavier than air flying machine, 10 rather than the balloon, and started the controversy between the lighter-than-air and the heavier-than-air camps, which has lasted to our day, and is not settled yet.

In 1903, when Langley was experimenting with his large sized aerodrome, and the Wright Brothers were beginning to apply motive power to their gliding machine, M. Archdacon appealed to the patriotic feelings of the French, that the whole art of aerial locomotion belonged to them or originated with them, and unless they should turn their attention to aviation they were in danger of being beaten by America. He offered a prize of Frs. 3000 for the first man to fly a distance of 25 meters in under test conditions, in a heavier than air flying machine. On August 22, 1906, M. Santos Dumont, made a tentative flight in his new "aeromobile", and on October 23, 1906 he ran this strange machine swiftly over the ground and glided boldly into the air, flying above the excited spectators at a speed of twenty-five miles an hour, and covering a distance of two hundred feet, thus gaining the Archdeacon Cup.

This was the first public flight in the world, made without any certain knowledge of the previous secret flights made by the Wright Brothers in America.

From this time the French have been feverishly active in the field of aviation. In October, 1907 the Aerial Experiment Association was organized with the object of constructing a practical aerodrome, driven through the air by its own motive power, and carrying a man, 11 This was a mere experimental association, financed by my wife, and consisting of the late Lieut. Selfridge, Mr. F. W. Baldwin, Mr. Glenn H. Curtiss, and Mr. J. A. D. McCurdy and myself. On March 12 1908, the Association succeeded in raising its first aerodrome, the Red Wing, into the air off the from the ice on Lake Keuka, near Hammondsport, N.Y. Mr. F. W. Baldwin, was the aviator on this occasion, which constituted the first public flight

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of an aerodrome in America. The Wright Brothers, of course, had previously flown, but nothing was known with certainty at that time concerning their achievements. Then in that same year —1908 the Wright Brothers for the first time appeared publicly in flight, Wilbur Wright in Europe, and Orville Wright in America, both startled the world with their achievements, and proved themselves to be the masters of their art.

From that time to this droming through the air has become an everyday accomplishment, and the French have gradually forged ahead until now there can be no doubt that they are foremost in the general art of aerodromics. In the science of aerodromics too, they have made great progress. The remarkable series of researches relating to the resistance of the air in connection with aviation made by Gustave Eiffel the noted engineer who designed the of the Panama canal during the French regime, and constructed the Eiffel Tower in Paris, have given to the engineers the ability to design and construct aerodromes on sound scientific principles and his work has benefitted the whole world as well as his own country.

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It is really remarkable that an old man, over eighty years of age should enter into this new field of engineering with the enthusiasm and vivacity of youth. His works have already become classics, and follow right along the lines laid down by the late Secretary of The Smithsonian Institution, Dr. Samuel P. Langley.

France now possesses two great aerodynamical laboratories for the prosecution of experimental work in aerodromics the one at St. Cyr and the other the great laboratory founded and carried on by M. Gustave Eiffel in Paris

In 1907 M. Eiffel published the results of experiments made at the Eiffel Tower. In 1911 he gave to the world further details of experiments at his aerodymanical laboratory in Paris in connection with aviation, and these result have been of great value to aerial engineers in designing and constructing flying machines upon right principles. Indeed

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his works upon the subject have already become classical. In view of the fact that his experiments have been directly in line with the researches of the late Secretary Langley the award of a Langley Medal to M. Eiffel seems to be peculiarly appropriate. We wish indeed, that M. Eiffel could be present with us to-day to receive it, but we are glad to welcome His Excellency the French Ambassador who will convey the medal to him in France, and we hope that His Excellency will consider the award of this medal not only as an appreciation of the Smithsonian Institution to his admirable researches but as some slight appreciation on the part of the Institution ?? the work of the French people in the science of aerodromics.

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a slight recognition of the debt we owe to the French people a slight recognition on our part of the debt we and the whole world owes to the French people.

The Smithsonian Institution awards a Langley Medal to M. Gustave Eiffel for advancing the science of aerodromics by his researches relating to the resistance of the air in connection with aviation.